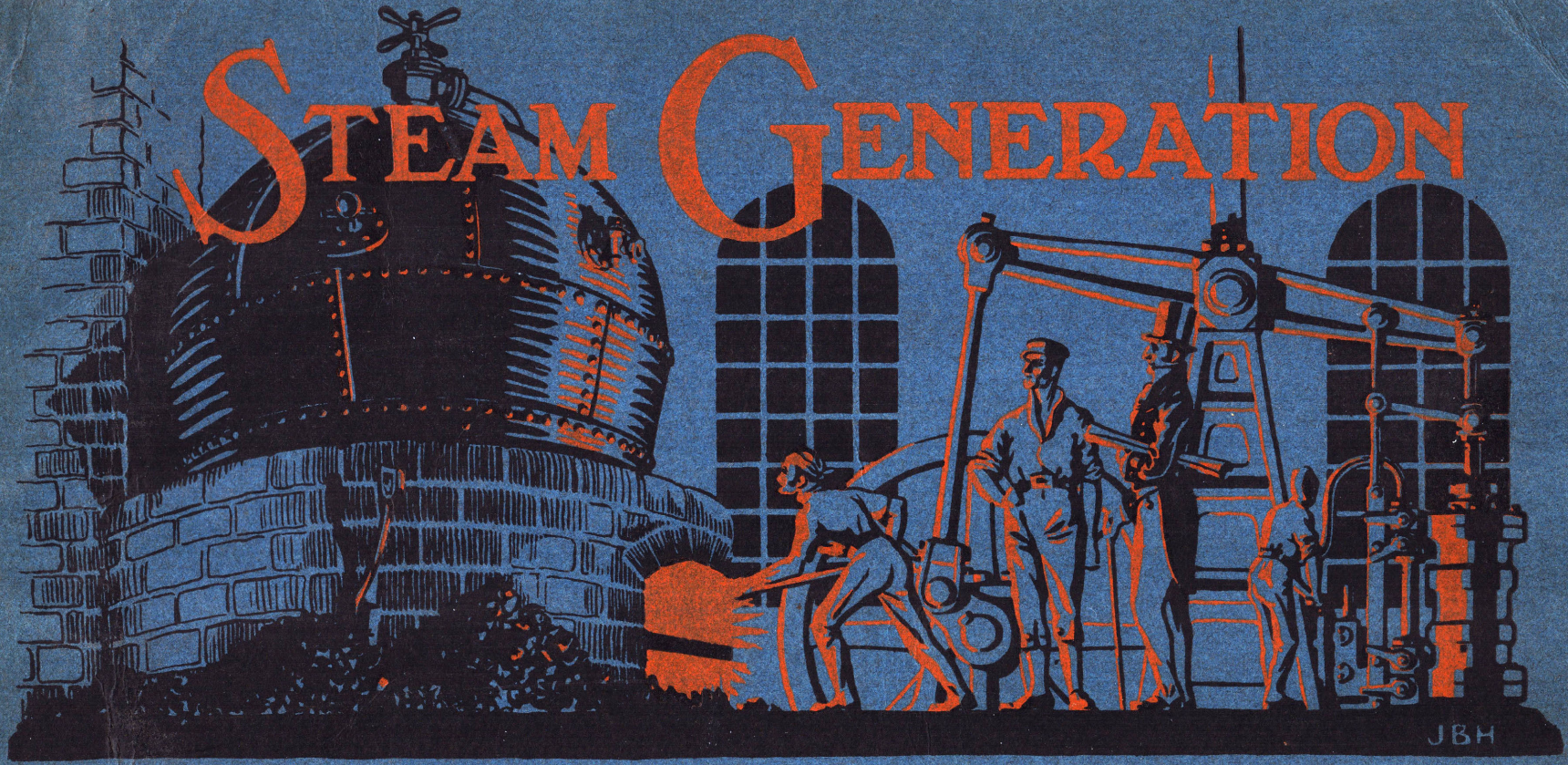
STEAM GENERATION



TOWN-GAS-FIRED BOILERS

LONDON SPENCER-BONECOURT LTD. HITCHIN

FORM No. 221/26. JULY, 1926

SPENCER-BONECOURT
LTD.,
PARLIAMENT MANSIONS,
VICTORIA STREET,
LONDON, S.W. 1.
TELEPHONE No. : VICTORIA 2802—3.

WORKS :
HITCHIN, HERTS.
TELEPHONE No. : HITCHIN 5.

Spencer-Bonecourt

(KIRKE PATENT)

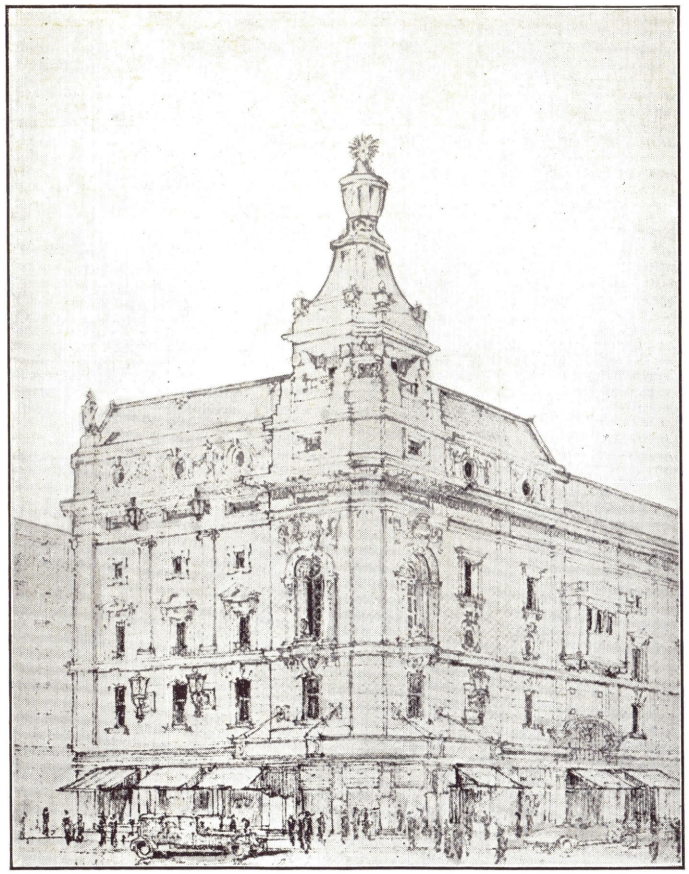
GAS-FIRED BOILERS & WATER HEATERS

LIST OF SIZES:—
BOILERS PAGE 27. HEATERS PAGE 37.

FORM 221/26.

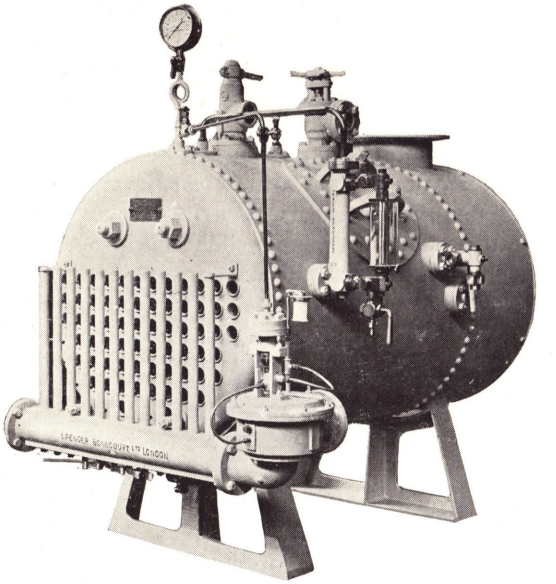
JULY, 1926.—This Catalogue cancels all previous Lists.

THE CAPITOL
CINEMATOGRAPH
THEATRE,
LONDON.



Town's Gas-fired Boilers are used for heating the air as it passes through the plenum system

A 5 B.
SPENCER-BONECOURT
PATENT BOILER
EVAPORATING
690 to 1,150 lbs. per hour,
WITH AUTOMATIC
GAS REGULATOR
(in foreground)



THE "SPENCER-BONECOURT" TOWN-GAS-FIRED BOILERS.

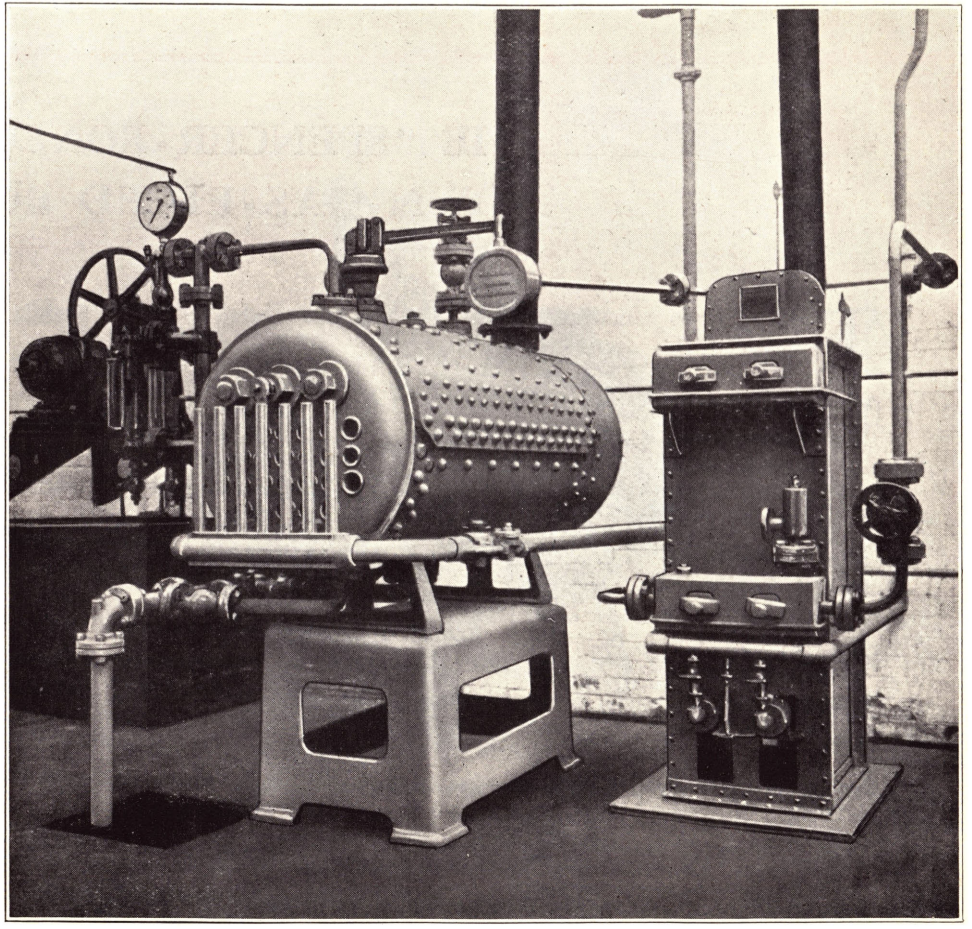
THE Boiler is constructed of mild-steel plates tested to British Standard Specification; the tube plates being flanged with ample radius to meet the shell, and the boiler tubes being of solid-drawn steel expanded into the tube plates. As will be seen in Fig. 1 the gas burner is independent of, and external to, the boiler. It consists of a cast-iron header, to which the gas-main is connected, and from which the burners arise. Directly opposite each boiler tube a gas nipple is fitted in the vertical pipe, the size of this orifice depending upon such factors as the pressure and calorific value of the gas, height of chimney, etc. It is usually in the region of $\frac{1}{8}$ in. The orifice is some 2 ins. from the end of the boiler tube so that the flame jumps this gap and enters the tube. It will be noticed there is *no primary air*; the natural draught of the chimney, together with the gas pressure, carrying the requisite air for combustion into the tubes on the injector principle. Normally there is a gas-jet playing into each tube; but to allow for variations in the steam requirement, there is a control valve on several of the vertical burner tubes, so that it is possible to cut one or more vertical set of burners out of action. These control valves will be seen underneath the header on pages 10 and 16; in the former case, three out of the seven vertical burners are subject to regulation.

Photograph of a

SPENCER - BONECOURT

PATENT BOILER

for a Normal Working Pressure of 750 lbs. per square inch, fired by Town Gas. At the side is seen a Superheater fired with the same gas.



In each boiler tube there is a length of soft-iron spiral core (Fig. 1). This core is placed in the tubes for the following reasons: it accelerates the mixing of the fuel and air, also combustion; it transmits to the water heat developed by the combustion by radiation instead of by conduction alone—thereby greatly accelerating the transmission; it prevents the gases passing down the centre of the tube without coming in contact with the heating surface; and it increases the length of the path of flow of the gases.

Fig. 1.

The products of combustion pass on their spiral course through the boiler tubes into a chamber at the rear. This chamber is an integral part of the boiler, and is formed by a continuation of the boiler shell, the flue pipe being connected to it. The height of flue pipe depends on several factors—especially on the amount of steam required from the boiler—and varies from 15 to 40 ft.

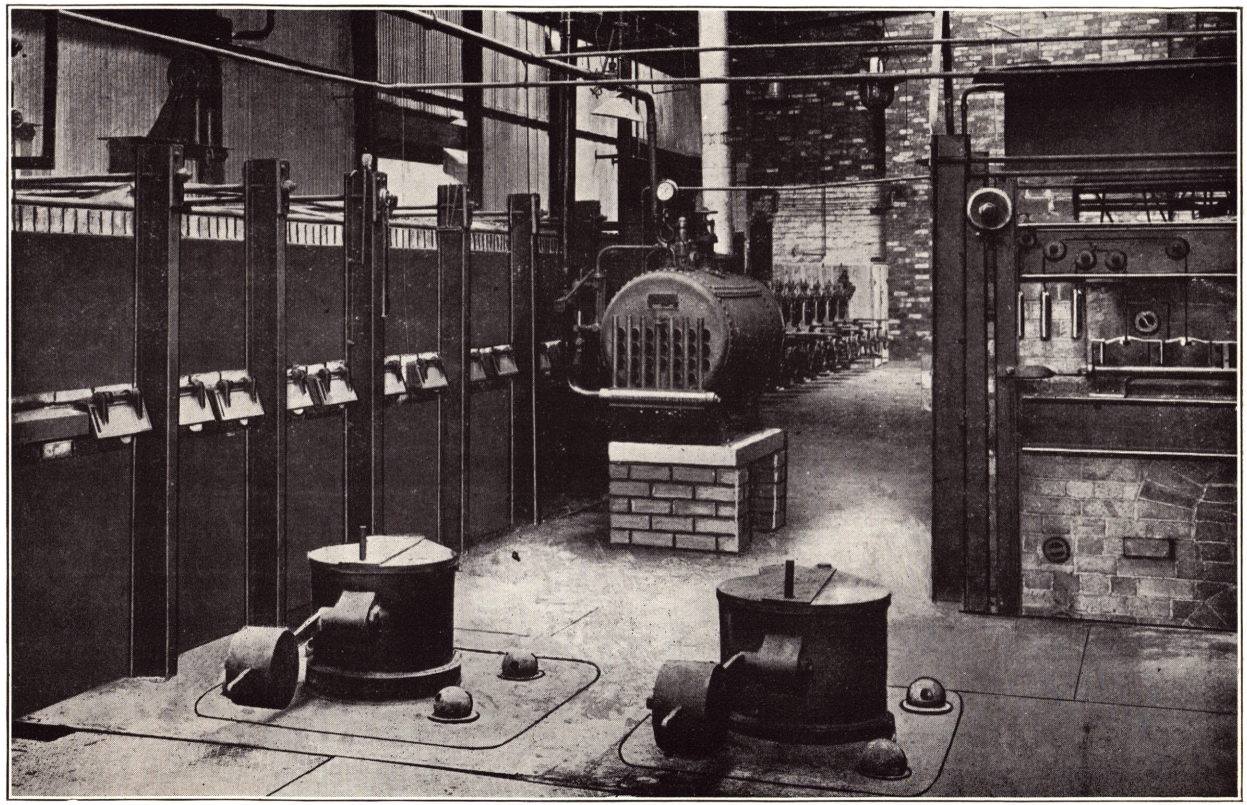
The efficiency of these small natural draught Boilers, where outgoing products have to retain a sufficient temperature to operate the draught, is approximately 85%; the 15% loss can be divided into radiation loss from the Boiler 2%, and sensible heat loss in chimney gases 12/13%.

SPENCER-BONECOURT GAS-FIRED BOILER

ERECTED AT A WIRE WORKS IN THE MIDLANDS,

Extract from Letter.—

"The installation shown on the photograph is running at a cost of about 10d. to 1/- per hour in Town's Gas, with a very little labour indeed, whereas, previously, a man had to be almost in constant attention to the vertical boiler because of firing, cleaning out and smoke, the latter being a serious matter on a little vertical boiler and cannot be avoided, as if coke is used, the same steaming results are not obtained."

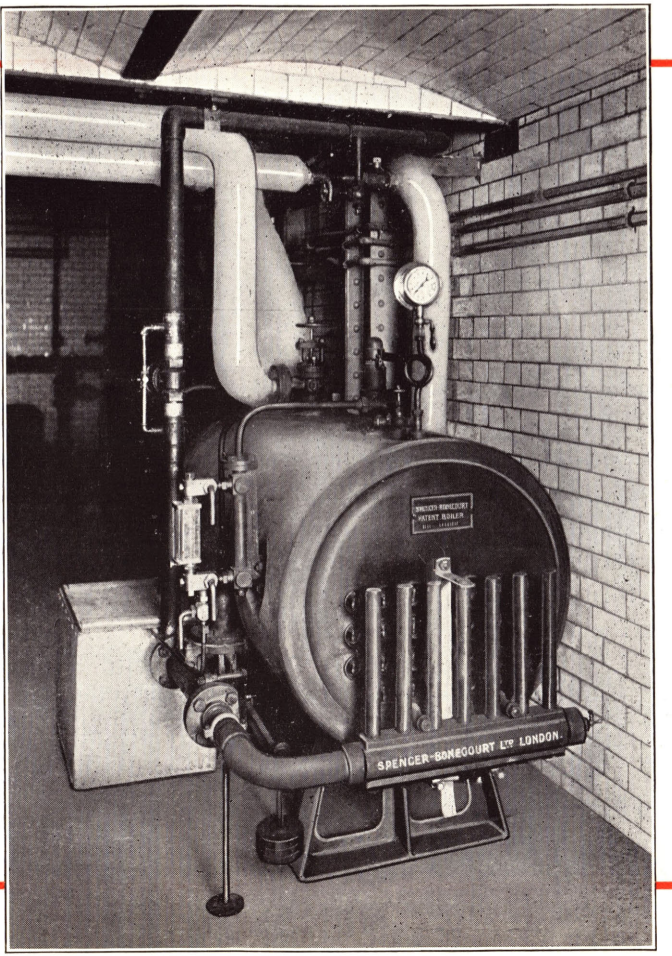


The following figures are taken from a test made on a 3B. Boiler operating under ordinary running conditions in the kitchen of a large restaurant in Scotland ; the efficiency figure takes into account all losses, etc., incurred during the stand-by periods of a 24-hour test, *i.e.*, starting up, etc.

Size number of Boiler	3B.
Over-all dimensions	2 ft. 3 in. by 5 ft. 9 in.
Mean draught	Natural, $\frac{2}{10}$ in. W.A.
Average pressure through test...	10 lbs. per sq. in.
Fuel	Town gas of 450 B. Th. U. nett.
Duration of test	24 hours.
Average hourly evaporation	397 lbs. from and at 212° Fahr.
Average hourly gas consumption corrected to N.T.P.	990 c.ft.
Thermal efficiency	86%.
Whether lagged or not...	Yes.
Location of Boiler	In kitchen of large restaurant for steam cookers.

As the boiler sits on cast-iron cradles it will be noticed that the unit is entirely self-contained, and that there is a complete absence of brickwork. The boiler mountings, injector (or feed pump), are of course in conformity with the best practice.

No. 3 B.
SPENCER-BONECOURT
PATENT
TOWN-GAS-FIRED
BOILER
INSTALLED FOR THE
Daily Telegraph.



✶

TWO BOILERS SUPPLIED

✶

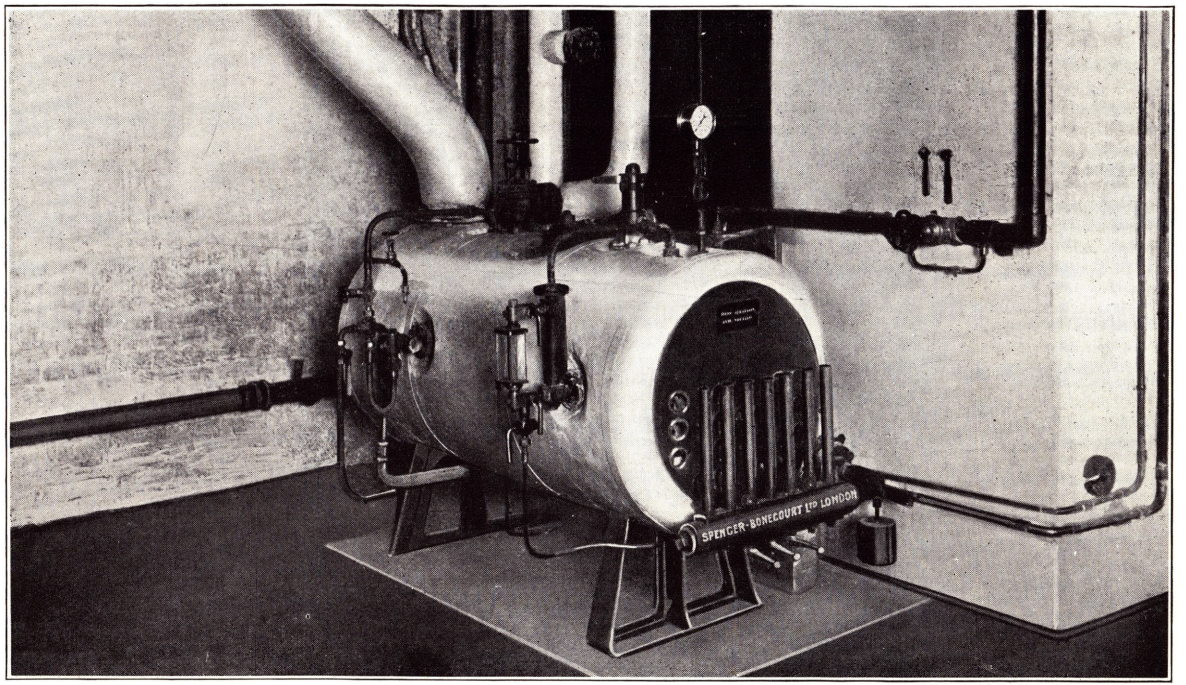
. . AUTOMATIC ACTION . .

THE main gas-valve on the gas-main is fitted as close to the boiler as possible; and round this valve a small by-pass and valve are arranged. The capacity of this by-pass is such that, when opened, the gas may be lighted at the orifices comparatively leisurely. Immediately there is a minute gas flame at each orifice, the main gas-valve is opened. Knowledge as to the duty of the boiler settles the question as to how far open the gas-valve should be under steaming conditions. Should the demand for steam be absolutely steady, it is possible to so manipulate the main gas-valve and the small valves controlling the individual burners that the pressure is maintained steadily. In the majority of cases there is at least a marked intermittency: and this factor calls for an automatic regulator capable of shutting down the gas supply when the drawing of steam from the boiler is reduced, and of admitting gas to the burner as the demand for steam increases. The "Spencer-Bonecourt" Gas Regulator fulfils these requirements in a highly satisfactory manner. A regulator is seen coupled-up to the right-hand end of the header on page 2: and this accessory can be set to maintain the boiler pressure at any figure up to full working pressure. Consequently, when this is installed, there is no necessity to constantly watch the pressure gauge, or to manipulate the gas controls with every variation in the demand.

The question of an automatic feed-water regulator depends upon two factors—the boiler pressure, and whether all the condensate can be returned to the boiler. If the working pressure is higher than 25 lbs. per sq. in., the automatic

No. 3 B.
SPENCER-
BONECOURT
PATENT
TOWN-GAS
FIRED
STEAM
BOILER
INSTALLED
FOR
The Times.

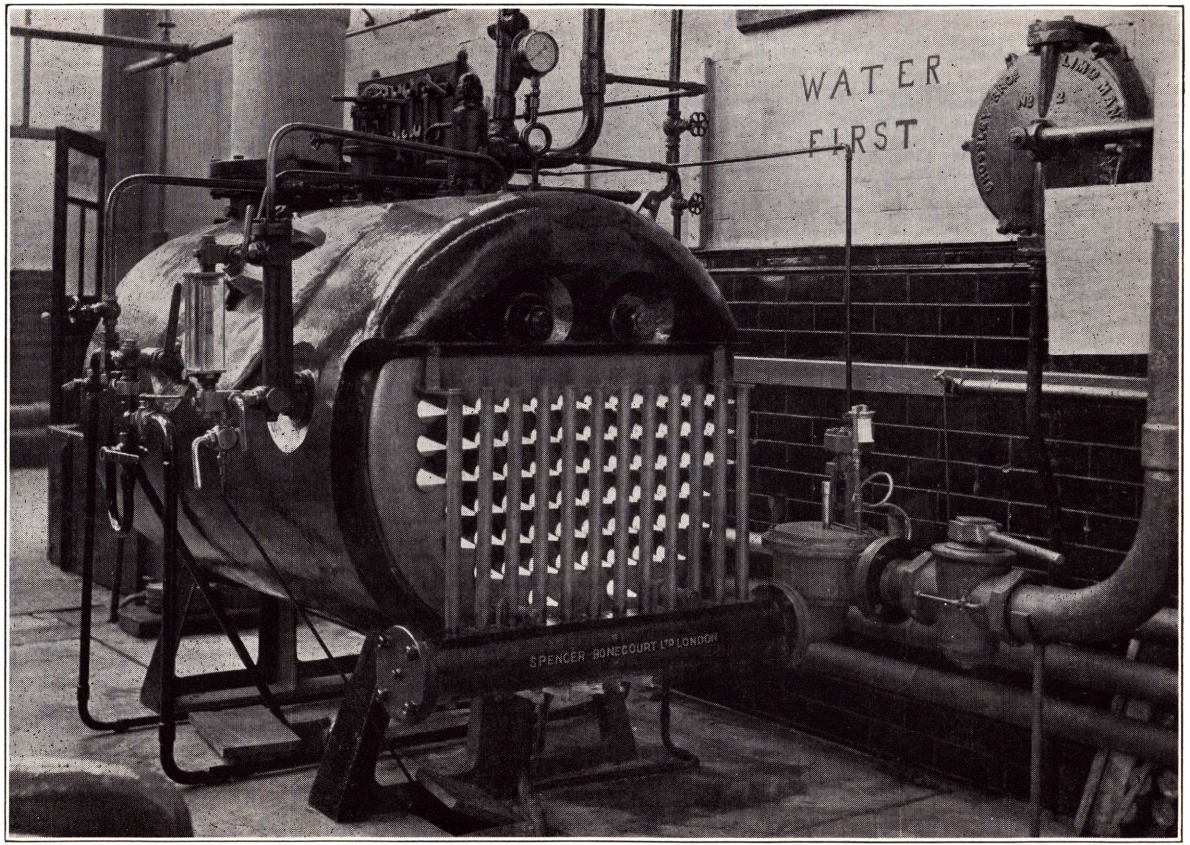
TWO BOILERS SUPPLIED



regulation of the feed-water is a comparatively costly item, calling as it does for a duplex feed-pump and a feed-water regulator of orthodox pattern. An apparatus of this description will be seen illustrated on pages 18 and 28. Under 25 lbs. per sq. in. the feed-water can be supplied by gravity, and can then be controlled by a ball valve enclosed in a chamber; this forming a cheap, simple and very efficient accessory for the automatic feeding of boilers. When the whole or part of the condensate is returned to the boiler, it is obvious that the amount of fresh feed is thereby reduced.

The installation of a gas-fired steam boiler with the automatic gas and feed-water regulators referred to above, results in an equipment which is entirely automatic in action. A number of plants have been installed on these lines, particularly in connection with factories, hospitals and public buildings; and all overhead charges for stokers and general supervision have been eliminated.

No. 5 B.
SPENCER-
BONECOURT
PATENT
TOWN-GAS
FIRED
STEAM BOILER
INSTALLED
FOR
Burnley Technical School.



. COMPARISON OF COSTS .

IT cannot be over-emphasized that the rule-of-thumb methods relied upon in estimating factors relating to solid-fuel firing must be dismissed when it comes to handling a gas-fired proposition. Take the case of apparatus requiring 500 lbs. of steam: In computing a solid-fuel fired boiler, the size of the boiler would be governed by this demand; unfortunately, nobody seems to worry about the annual cost of coal for such a small job, though this cost normally greatly exceeds the initial cost of the boiler. If, in a very rare instance, this matter is investigated, it is assumed that the boiler—say, an ordinary vertical cross-tube pattern—would have an efficiency of 50% and might require 1 lb. of good coal per 6 lbs. of steam evaporated from and at 212° Fahr. In other words, the boiler would have to be fired with 84 lbs. of coal per hour to give 500 lbs. of steam. The cost of 84 lbs. of coal is known; this is the figure based upon in making a comparison between the cost of coal and gas firing. Before going into the question as to this latter item, let us look at the inaccuracies upon which this cost of solid-fuel firing is based. In the first place, it may be stated categorically that the efficiency of the average vertical cross-tube boiler to give 500 lbs. of steam per hour is not 50%. It may be when new; but experience shows that in the majority of cases it is much lower than this under ordinary running conditions. Then again, no matter how steady a steam demand may be thought to be, there is bound to be some variation. It is found that generally a so-called steady demand of 500 lbs. per hour actually results in an evaporation of about 2,000 lbs.

BRITISH COLUMBIA ELECTRIC BUILDING, VANCOUVER.
HEATED BY THREE
SPENCER-BONECOURT PATENT GAS-FIRED BOILERS.

Automatically Controlled, providing Low Pressure Steam for Heating and Steam at 125 lbs. per square inch for General Power Purposes. These superseding Two Large Oil Fired Boilers in brick setting.

(See Page 16.)

of steam per eight working hours. Sometimes this figure may be 2,500; but seldom does the actual evaporation over a period approximate a figure which is a product of the evaporation multiplied by the number of hours.

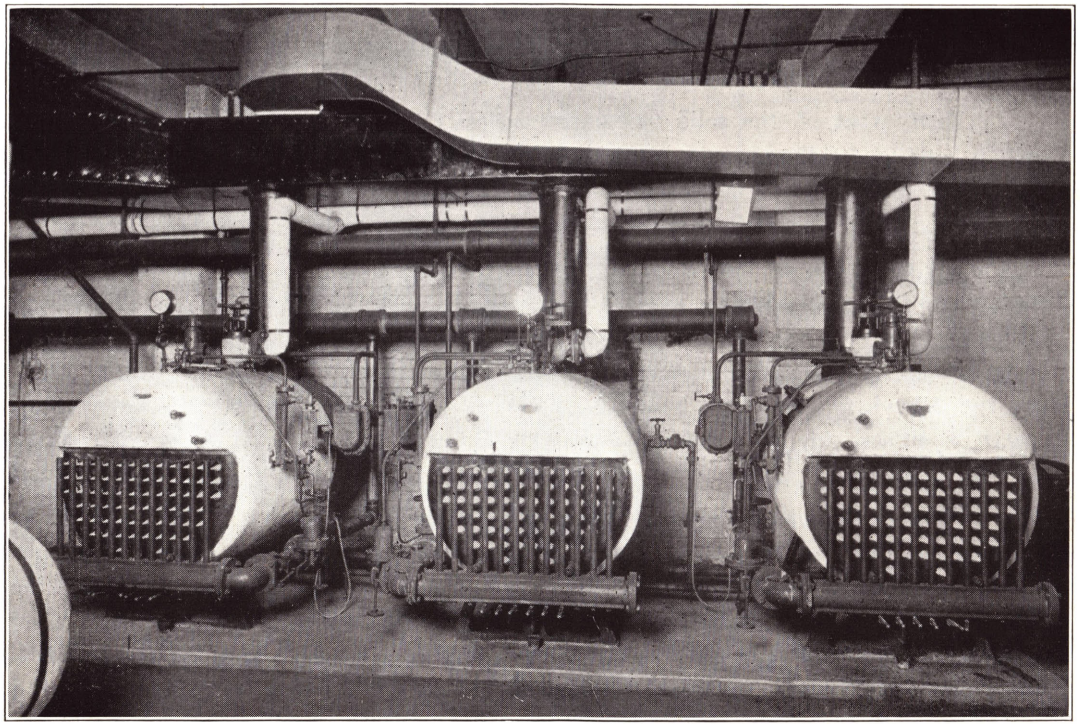
Then, what of the solid fuel burnt uselessly, the extra time taken to get up steam in the morning—at least half-an-hour longer than would be the case in a gas-fired unit? What of the fuel burnt during the mid-day break, and the coal remaining on the bars at the end of the day? How often do these matters receive any consideration by steam users, though here we are accounting for quite 10% of the annual fuel bill?

The contention is that solid-fuel firing costs much more than is realized on a steady steam demand; and this is accentuated if there is a known intermittency, for partially burnt coal cannot be recovered once it is stoked. Moreover, the efficiency of a coal-fired boiler always falls on the lighter loads. These factors enter very vitally into the comparison between coal and gas, yet it is difficult to assess the actual figures for coal. On the other hand, all the "holes in the bag" are stopped when a gas-fired boiler is installed. Owing to the great difficulty in obtaining true running figures on coal, it is difficult to give a definite answer to the question: "How much more, or less, shall I have to pay if I instal a gas-fired boiler?"

Before we give a tabulated comparison let us consider a town-gas-fired boiler proposition. Half-an-hour suffices to raise 100 lbs. pressure from cold; thereafter a regulator ensures that gas is consumed only as the steam is required. The intermittency may vary from 100 to 10%—the regulator looks after that. When there is no demand, the main gas valve is closed. Even radiation losses are much lower in the case of gas-fired units, because they are, for a definite evaporation, smaller than vertical cross-tube boilers. At the end of the day the gas is turned off and there is no banked fire or clinker to cause an outbreak of fire on the premises.

THREE 5 B.
SPENCER-
BONECOURT
PATENT
BOILERS

Fired with 450 B.T.U. Town's Gas, heating British Columbia Electric Railway Company's Main Office Building, Five Storey Building Corner Block exposed on all sides.



SOLID FUEL AND TOWN GAS.

"STEADY" requirement of 500 lbs. of steam per hour 50 working hours per week, load factor 60%, 100 lbs. working pressure. All efficiencies taken as running (not catalogue) efficiencies at the load factor. Feed water 60°F. Total heat per lb. steam 1,156.5 B.T.U's.

SOLID FUEL

(Coal 11,000 B.T.U's. per lb. nett.)

Fuel per hour	106 lbs.		
Fuel per 50 hours	2.37		
Plus 12½% uselessly burnt	.29		
	2.66 tons.		
At 25/- per ton delivered...	£3	7	0
½ Stoker's time	1	10	0
Ash removal	0	5	0
	£5	2	0 per week.

TOWN GAS.

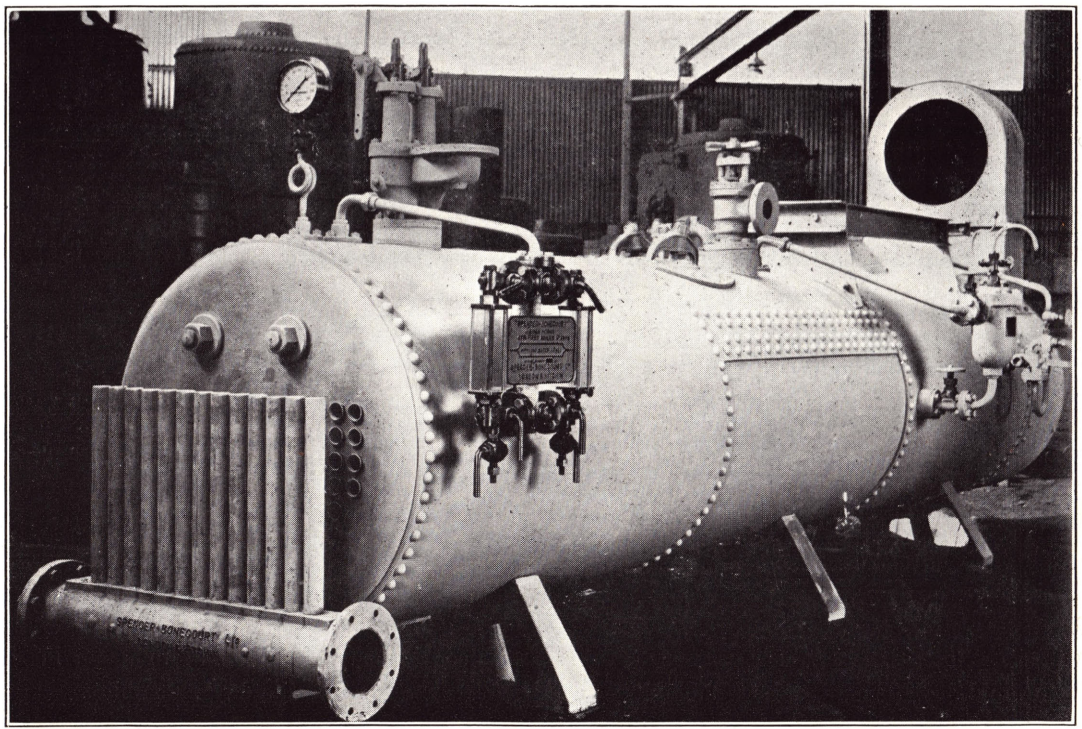
Gas 500 B.T.U. nett.

Gas per hour	810 cu. ft.		
Per 50 hours	40,500 cu. ft.		
Plus 2½% uselessly burnt...	1,010 cu. ft.		
	41,510 cu. ft.		
At 2/6 nett per 1,000 cu. ft.	£5	4	6
No Stoking	—		
	£5	4	0 per week.

Note, the 12½% uselessly burnt refers to the coal consumed in getting up steam in the morning, that burnt through the mid-day break, and fuel remaining on the bars at the end of the day's steaming.

A LARGE TOWN'S GAS-FIRED BOILER UNDER CONSTRUCTION AT OUR WORKS.

The Girder Saddle on the top of the Boiler and the Products Chamber at the rear are arranged to accommodate an Induced Draught Equipment.



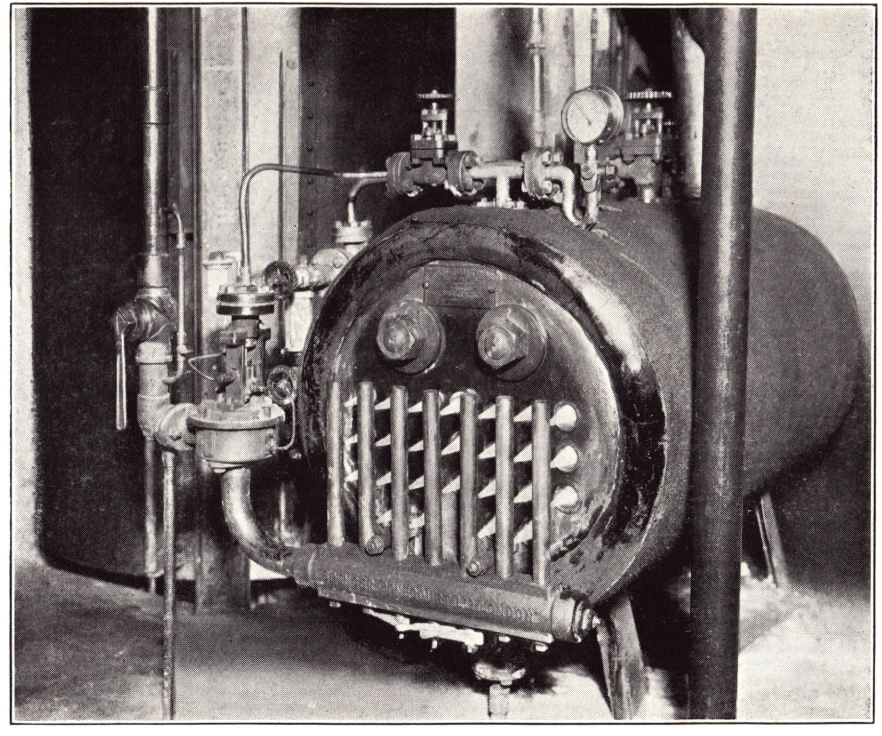
There is one factor which has been taken into account in the above comparison—it is assumed the safety valve of the coal-fired boiler would operate from time to time, due to reductions in the steam demand; this variation in the case of a gas-fired boiler is, of course, taken up on the automatic gas regulator.

It has been stated that it is generally found that a steady load is far from steady, and that the load factor approximates 60%. This leads us to the question as to the type of proposition for which a gas-fired boiler may be employed. If the load factor should be higher than 60% (such propositions will comprise steam-heating installations), a comparison between coal and gas firing would show a slightly increased cost of gas, while the charge for solid fuel would be unaffected. As a purely heating load may be regarded as steadier than any other, it usually costs more for gas firing than would be the case in a solid-fuel installation. However, there are a number of directions, such as steam heating for operating theatres, wherein the slight extra cost for gas firing is more than justified by the inherent advantages of this system. Apart from normal heating duties, town-gas-fired boilers are always a proposition for any steam requirements from 50 to 2,000 lbs. per hour.

They are particularly suitable for week-end heating; for cooking plants; for installation in connection with the cinematograph film industry, where dust must be eliminated; in bakeries where the boilers may be located by the ovens; in printing establishments for steam supply to the matrix presses and in moulding and vulcanizing works—in fact, anywhere where cleanliness is essential. They eliminate coal cartage, ash removal, dirt, dust and smoke; consequently they do not require a boiler-house. They may be installed by the side of the plant to which they supply steam; thus reducing overhead charges, and eliminating them if fitted with the automatic regulators to which reference has been made. A

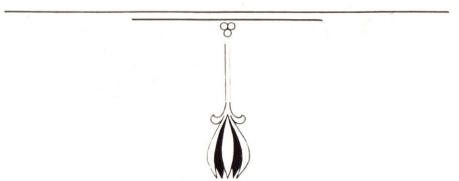
No. 3 B.
SPENCER-BONECOURT
PATENT
TOWN-GAS-FIRED
STEAM BOILER.

Normal Working Pressure
300 lbs. per square inch.



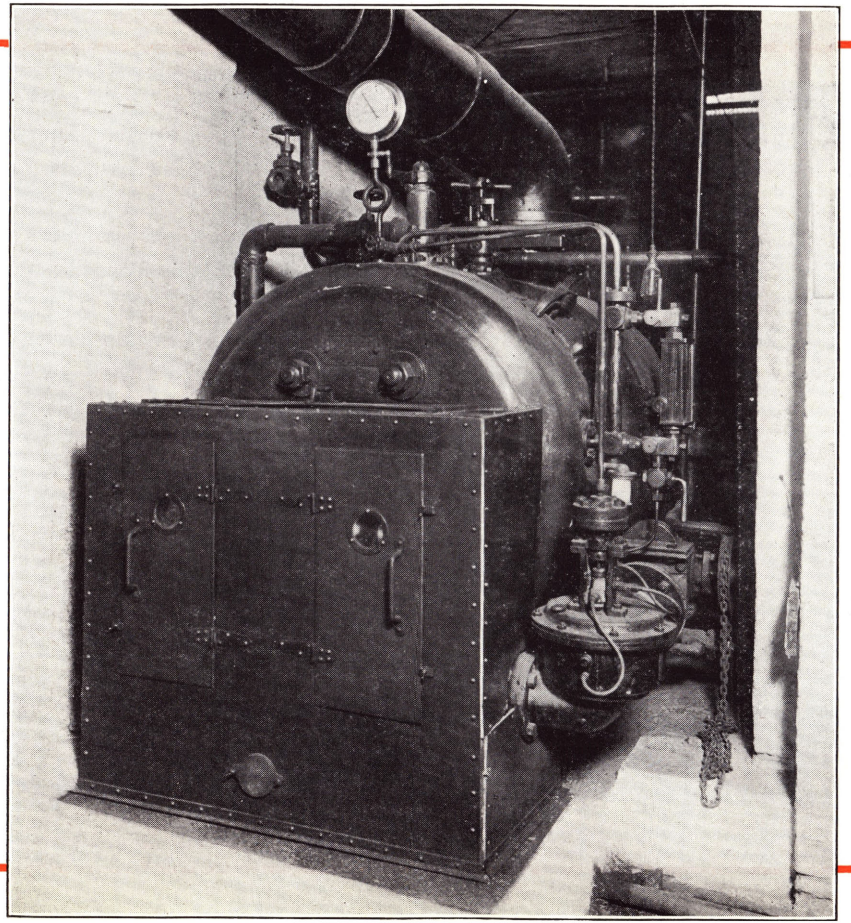
gas-fired boiler in a works in London runs continuously for periods of six weeks. The premises are in occupation during the daytime only, the boiler being left to look after itself during the night and week-ends.

Regarding the cost of a "Spencer-Bonecourt" town-gas-fired unit, the standard working pressure is 120 lbs. per sq. in., and its cost is no higher than that of a vertical boiler for the same capacity and working pressure. For lower pressure work—say, 25 lbs. to 50 lbs. per sq. in.—the cost of the gas-fired unit is slightly higher than for a coal-fired unit, because the same 120 lbs. working pressure boiler is installed, for it is impracticable to differentiate to any extent between high and low pressures on account of the small diameters of gas-fired units. In this case the prospective purchaser has the satisfaction of knowing that, though called upon to pay slightly more for the gas-fired boiler, he has the potentiality of the higher pressure if required at any time.



No. 5 B.

SPENCER-BONECOURT PATENT TOWN-GAS-FIRED STEAM BOILER.



Installed for Islington Borough Council at their Caledonian Road Baths, London.

. . . SPECIFICATION . . .

SPENCER-BONECOURT (KIRKE PATENT) STEAM BOILERS.

THE following asbestos-packed mountings are provided as standard:—Angle steam valve, pop safety valve, water gauge with glass, rings, and protector, steam gauge with syphon, feed check valve with shut-off cock, blow-off cock, "Simplex" injector complete with fittings, McNeill's man-hole, and mud-hole doors. The steam fittings are fitted on forged seatings studded to the boiler to clear for lagging. In addition to the above a pair of C.I. cradles for carrying the boiler, and set of gas burners calibrated for the gas supply available, are supplied.

Thermometer in outlet products box.

Spares consist of:—1 set of manhole and mudhole door joint rings, 1 water gauge and glass and complete set of rings.

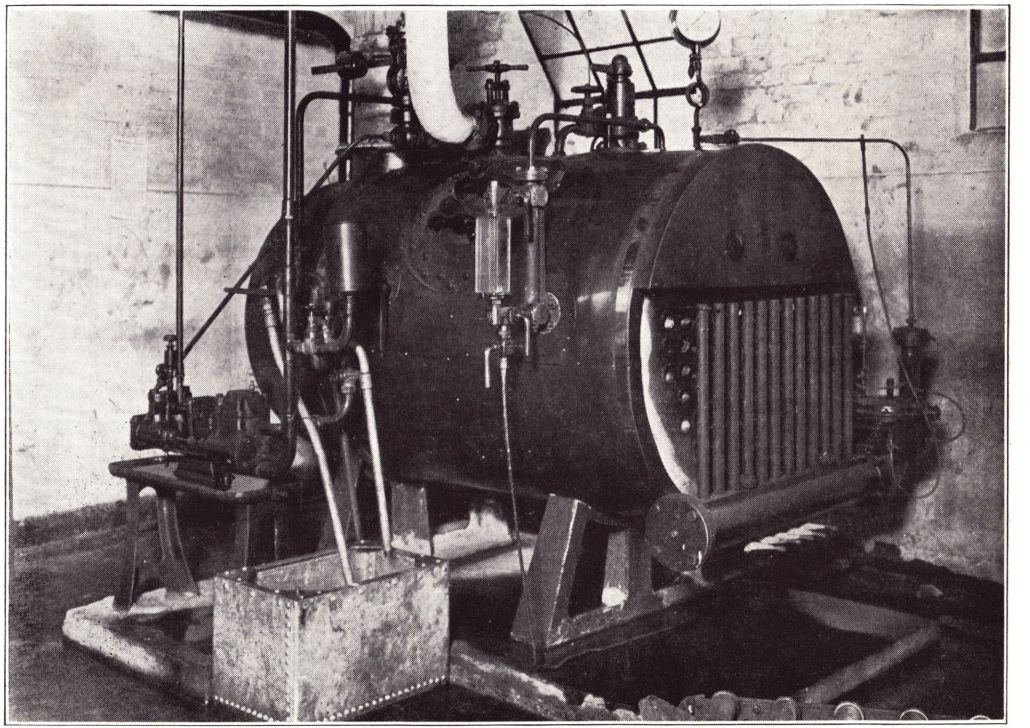
All boilers are tested hydraulically before despatch from the Works.

No. 5 B.

SPENCER-BONECOURT PATENT TOWN-GAS-FIRED STEAM BOILER.

✷

Installed for
United Dairies Ltd.
at their
R. Higgs & Sons, Ltd.
Branch,
Brixton, London.



SOME USERS OF TOWN-GAS-FIRED BOILERS.

"THE TIMES," London ... ... 2 Boilers
"THE DAILY TELEGRAPH," London ... ... 2 ,,
"THE DAILY MAIL" (Amalgamated Press Ltd.) ... 3 ,,
EYRE & SPOTTISWOODE LTD. ... ... 3 ,,
NEWNES & PEARSON LTD. ... ... 1 Boiler
HAZEL, WATSON & VINEY LTD. ... ... 1 ,,
ODHAMS PRESS LTD. ... ... 2 Boilers

ROWNTREES LTD., York, have a boiler supplying steam for toffee boiling.

SLAZENGERS LTD., the Tennis Racket firm, for timber drying.

J. H. HOPKINSON LTD., Huddersfield.—These well-known manufacturers of boiler mountings use a "Spencer-Bonecourt" Boiler for testing purposes. The maximum working pressure of this boiler is 750 lbs. per square inch.

JEWISH SYNAGOGUE, London.—Heating.

BIRKENHEAD PARK FOOTBALL CLUB.—Baths.

ASTON VILLA FOOTBALL CLUB.—Baths.

HUDDERSFIELD TOWN FOOTBALL CLUB.—Baths.

PALAIS-DE-DANSE, Brixton.—Heating.

BASS, RATCLIFFE & GRETTON LTD., the well-known Brewers, have a boiler in their Liverpool Bottling Stores.

J. LYONS LTD., London.—Restaurant Cooking.

NESTLES MILK.—Culture of Bacteria.

HANS RENOLD.—Staff Cooking.

LONDON CO-OPERATIVE SOCIETY.—Steaming Bakers' Ovens.

MURRAYS RESTAURANT, Glasgow.—Restaurant Cooking.

GLAXO.—Milk Testing.

CALLARD, STEWART & WATT LTD., London.—Restaurant.

UNITED DAIRIES LTD.—Dairy Work.

SOUTH WALES DAIRY AGENCIES LTD.—Dairy Work.

SOUTH WALES SCHOOL OF MINES.

NATIONAL PHYSICAL LABORATORY.—London.

ROYAL COLLEGE OF SCIENCE.—London.

OXFORD UNIVERSITY.

DUBLIN, BURNLEY, WOOLWICH TECHNICAL SCHOOLS, etc.

No. 3 B.

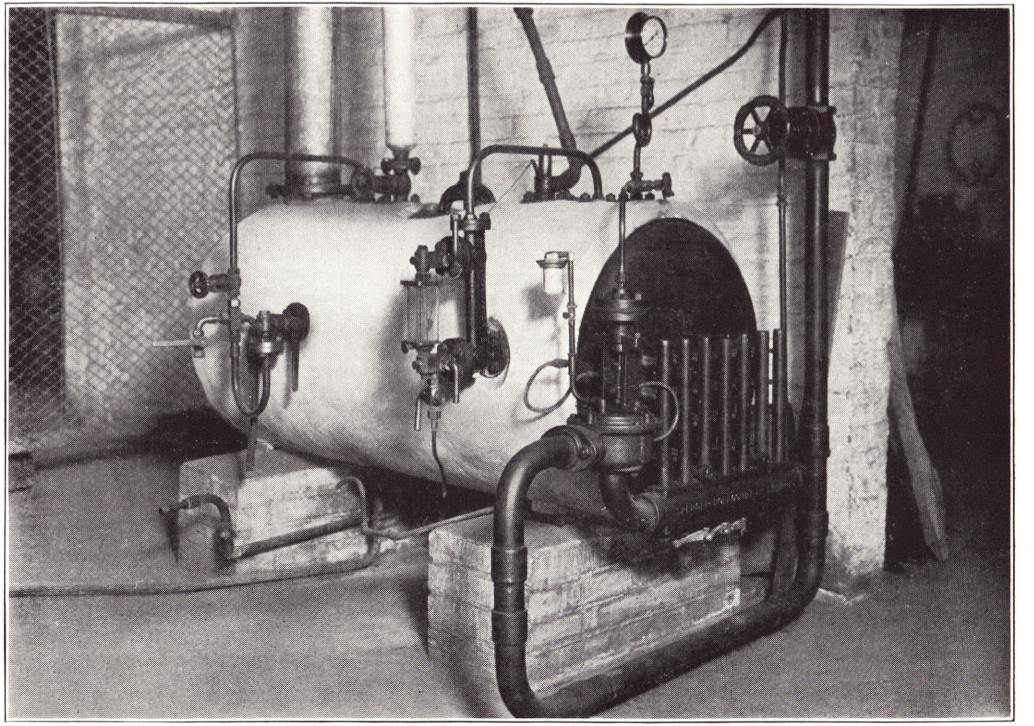
SPENCER-BONECOURT PATENT TOWN-GAS-FIRED STEAM BOILER.

*

Normal Working Pressure
175 lbs. per square inch.

*

Installed for the manufacture of Insulating Material.



SIZE No.	APPROX. DIMENSIONS IN FEET.	NUMBER OF TUBES.	EVAPORATION IN POUNDS OF STEAM FROM AND AT 212° F. PER HOUR WITH 3" GAS PRESSURE AND CHIMNEYS;—			DIAM. OF CHIMNEY.	SIZE OF GAS PIPE.	SIZE OF BY-PASS TO MAIN GAS VALVE.	SIZE OF METER IN 'LIGHTS.'
			15' HIGH. $\frac{3}{32}$ in. W.G.	25' HIGH. $\frac{5}{32}$ in. W.G.	40' HIGH. $\frac{1}{4}$ in. W.G.				
$\frac{1}{2}$ B§	$1\frac{1}{4}' \times 4\frac{1}{2}'$	7	46	60	77	5"	$1\frac{1}{2}$"	$\frac{1}{8}$"	50
1 B	$1\frac{1}{4}' \times 5'$	7	73	96	122	5"	$1\frac{1}{2}$"	$\frac{1}{8}$"	50
2 B	$1\frac{3}{4}' \times 5\frac{1}{4}'$	16	168	220	280	5"	$1\frac{1}{2}$"	$\frac{1}{4}$"	100
3 B	$2\frac{1}{4}' \times 5\frac{3}{4}'$	25	262	343	437	7"	2"	$\frac{1}{4}$"	200
4 B	$3' \times 6'$	46	483	632	806	10"	3"	$\frac{3}{8}$"	400
5 B	$3\frac{1}{2}' \times 6'$	66	690	900	1,150	13"	$3\frac{1}{2}$"	$\frac{3}{8}$"	500
6 B	$4' \times 6\frac{1}{2}'$	80	840	1,100	1,400	15"	$3\frac{1}{2}$"	$\frac{1}{2}$"	600
7 B	$4\frac{1}{2}' \times 6\frac{1}{2}'$	96	1,000	1,320	1,680	17"	4"	$\frac{1}{2}$"	800
8 B	$5' \times 6\frac{3}{4}'$	118	1,240	1,620	2,060	18"	4"	$\frac{3}{4}$"	900

§ This size made in Vertical Type only. All other sizes Horizontal Type only.
To get evaporation from water at 60° F. into steam at 120 lbs. working pressure divide pounds of steam by 1·2.
To find the cubic feet in one therm divide 100,000 by the declared calorific value (B.T.U.'s) of the gas.
All evaporations based upon town's-gas having a calorific value of 475 B.T.U.'s per cubic foot, gross.
A Chimney of galvanised sheet steel up to 25 feet high is supplied with the boiler.
With different gas pressures to those specified in the above table the output varies as the square root of the pressure,

e.g., if the gas pressure is 2" output will be $\frac{\sqrt{2}}{\sqrt{3}}$ *i.e.* $\frac{1.4}{1.7}$ of those tabulated.

LIST OF STANDARD SIZES OF SPENCER-BONECOURT (Kirke Patent) GAS-FIRED STEAM BOILERS.

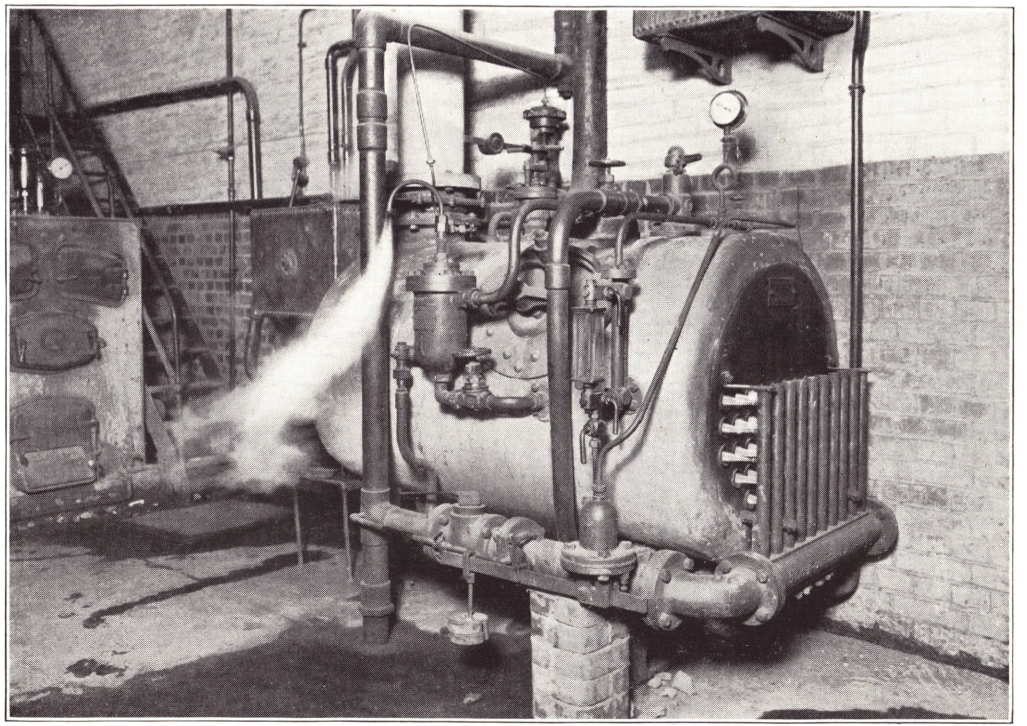
FOR CODE WORDS SEE PAGE 40.

No. 4 B.

SPENCER-
BONECOURT
PATENT
TOWN-GAS-FIRED
STEAM
BOILER.

✷

Installed at
London Temperance
Hospital.



"SPENCER-BONECOURT" (KIRKE PATENT) WATER HEATERS.

These Heaters embody the essential features which have made "Spencer-Bonecourt" Gas-fired Steam Boilers so very popular with small steam users. Some hundreds of Gas-fired Boilers have been installed for all kinds of duties, and the Water Heaters are an adaptation of the Steam Boilers for water heating.

. . . WHAT THEY ARE . . .

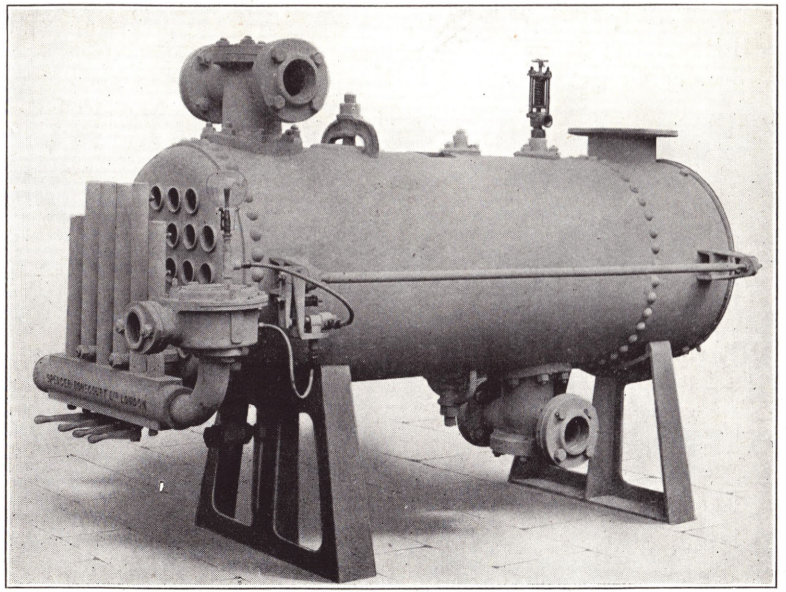
THE simplest and most efficient water heater known, their thermal efficiency being higher than any other gas-fired heater on the market because a very high percentage of the heat of the gas cannot escape except into the water.

They are designed for every class of heating duty to replace the ordinary cast-iron sectional boiler.

They have no firebox and the burners are designed so that no primary air is required, hence back-firing is impossible at any load.

The heaters are horizontal as standard, but where floor space is restricted, a vertical heater can be put forward. Both types are entirely self-contained.

STANDARD
2 B.H.
SPENCER-BONECOURT
(KIRKE PATENT)
GAS-FIRED
WATER HEATER
with Thermostatic Gas
Control.



. . . . WHAT THEY DO . . . .

SUPPLY any quantity of hot water at any temperature. They have a guaranteed efficiency of 85% and are unrivalled for ordinary heating duties particularly where the load is variable or where there is a probability of sudden demands on heating apparatus, during "week-end" heating: for Public Baths, Washhouse Installations, etc. Their cleanliness, ease of handling and unequalled efficiency are outstanding features.

They eliminate stand-by losses, as the gas is simply turned off when heat is no longer required, and turned down when less heat is required, and can be made self-regulating. They reduce maintenance charges to a minimum, owing to the even temperatures and the absence of flame on shell and joints. They eliminate coal storage and ash removal problems and banish smoke, soot, dirt and smuts from your Works.

They eliminate the risk of cracked sections ever present with the ordinary cast-iron sectional boiler.

Wherever dust has to be reduced to the very minimum as in the Cinematograph Film Industry or Printing Works, these heaters are particularly suitable for installation.

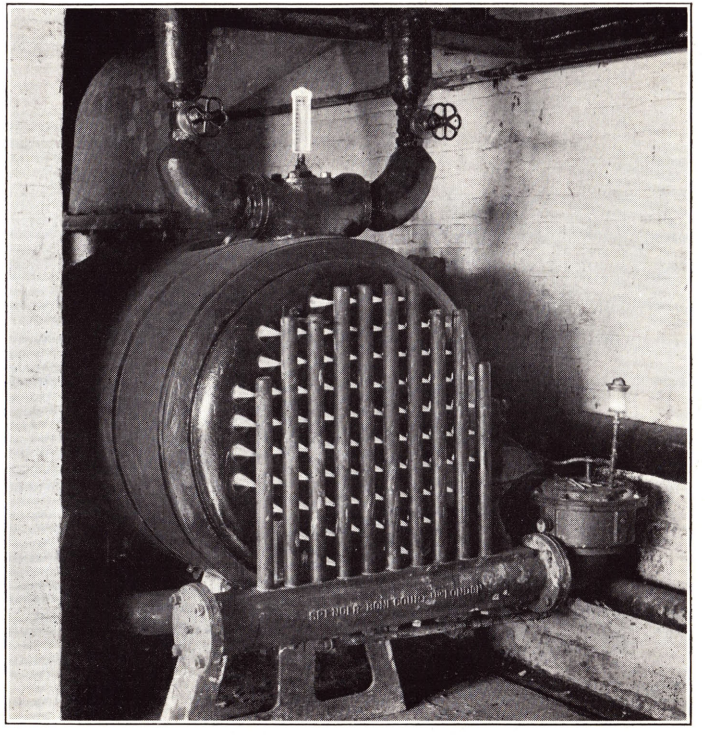
CHADDERTON

ELEMENTARY SCHOOLS.

4 B.H. TOWN GAS-FIRED
WATER HEATER
FOR CENTRAL HEATING.

600,000 to 1,071,600 B.T.U.'s per hour.

Automatic Gas Regulator to the right
of the Heater.



. . . WHAT THEY SAVE . . .

NO Boiler House is required. Stokers wages are eliminated, as with thermostatic control, they can be rendered entirely self-acting.

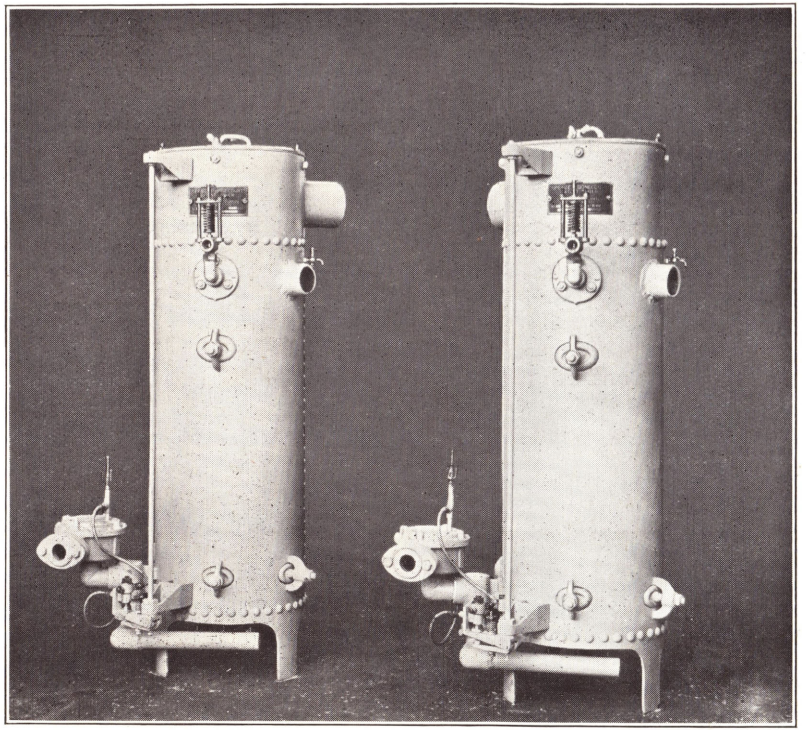
No space is required for coal or coke pile.

There are no charges for coal cartage and ash removal.

20% of your gas bill is saved as "Spencer-Bonecourt" Gas-fired Heaters are much more efficient than the ordinary Gas-fired Water Heater.

TWO ½ B.H.
VERTICAL
WATER
HEATERS

Installed at a well-known Restaurant in Regent Street, London.



These two Heaters provide the whole of the hot water for central heating, lavatories and kitchen purposes. Both of these Heaters are fitted with Automatic Gas Regulators.

. . . SPECIFICATION . . .

SPENCER-BONECOURT (KIRKE PATENT) WATER HEATERS.

THE Heater is constructed of best Siemens-Martin mild-steel plates tested to British Standard Specification. The tube plates are flanged with ample radius to meet the shell. Rivet holes are drilled in position from solid after the plates are bent, the rivetting being done by hydraulic or pneumatic pressure. The tubes are solid drawn steel, swelled at one end and expanded into the tube plates.

Two cleaning doors are provided and a pair of cast-iron carrying cradles for the horizontal pattern ; also complete burner as illustrated attached to boiler and calibrated for the supply of gas available.

Thermometer for screwing into flow pipe.

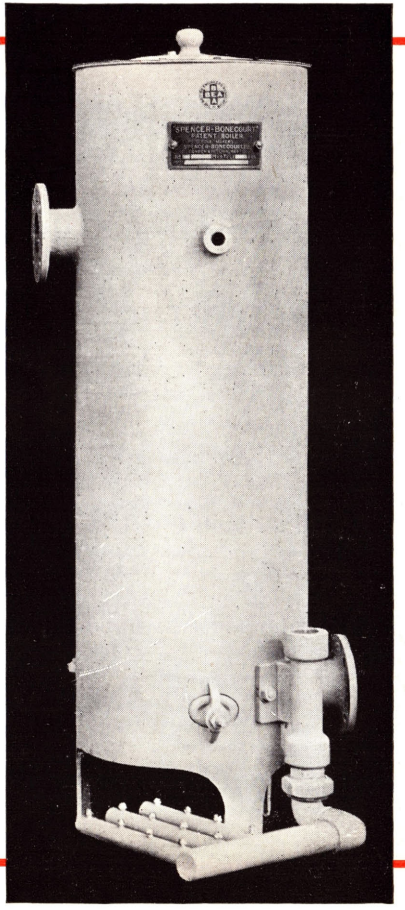
A safety valve and blow-off cock are provided as standard.

Thermometer in outlet products box.

All boilers are hydraulically tested before despatch from the Works and standand heaters are suitable for heads of 100 feet.

Spares consist of set of joint rings for cleaning doors.

½ B. H.
SPENCER-BONECOURT
(Kirke Patent)
GAS-FIRED
WATER HEATER.
Vertical Pattern 4′ 7″ high
by 15″ diameter.



DUTY

128,000 B.T.U.'s

PER HOUR

SIZE No.	APPROX. DIMENSIONS IN FEET.	B.T.Us. PER HOUR. GAS 3″ W.G. CHIMNEYS :—			SIZE OF FLOW AND RETURN BRANCHES.	DIAM. OF CHIMNEY.	SIZE OF GAS MAIN. Town Gas.	SIZE OF BY-PASS TO MAIN GAS VALVE.	SIZE OF METER IN 'LIGHTS.'
		15′ HIGH. $\frac{3}{32}$ in. W.G.	25′ HIGH. $\frac{5}{32}$ in. W.G.	40′ HIGH. $\frac{1}{4}$ in. W.G.					
$\frac{1}{2}$ B.H.	1′ 3″ × 4′ 7″	64,800	94,800	128,400	2″	5″	$1\frac{1}{2}$″	$\frac{1}{4}$″	50
1 B.H.	1′ 3″ × 5′ 2″	94,800	128,400	169,200	2″	5″	$1\frac{1}{2}$″	$\frac{1}{4}$″	100
2 B.H.	1′ 9″ × 5′ 2″	189,600	256,800	338,400	3″	7″	2″	$\frac{1}{4}$″	200
3 B.H.	2′ 3″ × 5′ 6″	331,800	449,400	592,200	4″	10″	3″	$\frac{3}{8}$″	400
4 B.H.	3′ 0″ × 5′ 9″	600,400	813,200	1,071,600	5″	14″	$3\frac{1}{2}$″	$\frac{3}{8}$″	600
5 B.H.	3′ 6″ × 6′ 0″	963,800	1,305,400	1,720,200	6″	16″	$4\frac{1}{2}$″	$\frac{1}{2}$″	800

With different gas pressures to that specified in the above table the output varies as the square root of the pressure,

All duties based upon town's-gas having a calorific value of 475 B.T.U.'s per cubic foot. gross.

e.g., if the gas pressure is 2" output will be $\frac{\sqrt{2}}{\sqrt{3}}$ *i.e.* $\frac{1{\cdot}4}{1{\cdot}7}$ of those tabulated.

$\frac{1}{2}$ B.H., Vertical Pattern only. 1 B.H., 2 B.H., 3 B.H., Vertical or Horizontal. 4 B.H., 5 B.H., Horizontal Pattern only.

LIST OF STANDARD SIZES OF SPENCER-BONECOURT (Kirke Patent) GAS-FIRED WATER HEATERS.

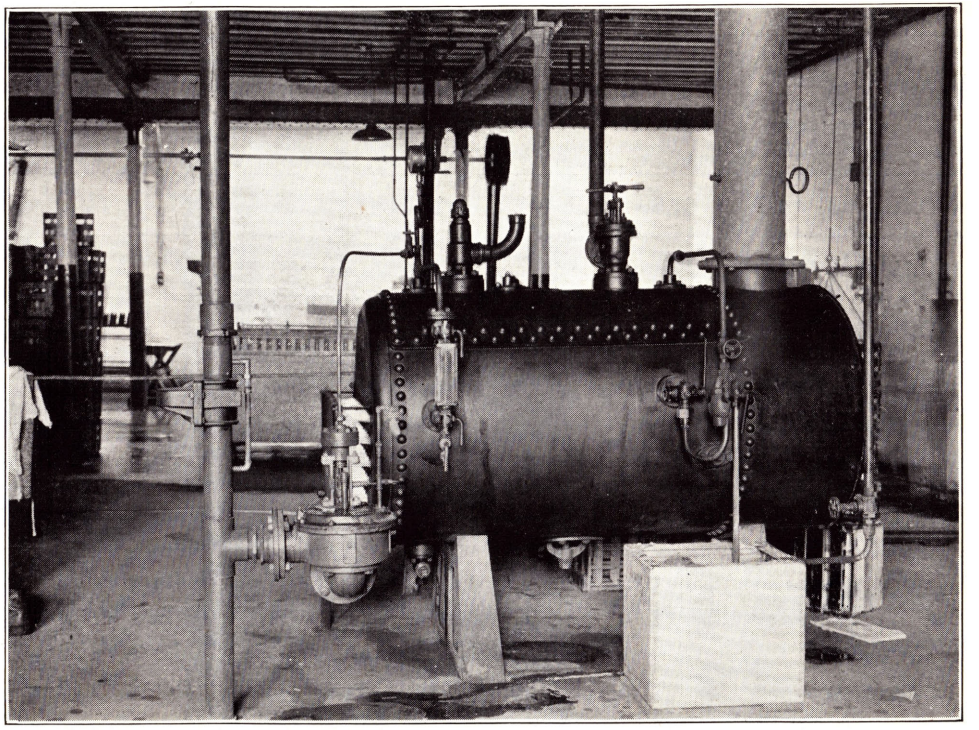
FOR CODE WORDS SEE PAGE 40.

No. 4 B.

SPENCER-BONECOURT PATENT TOWN-GAS-FIRED STEAM BOILER.

✷

Installed in a large Dairy in Derby.



"Spencer-Bonecourt" Boilers & Heaters

are working on gas supplied by all the leading Gas Companies in this Country and the Colonies, also many places abroad.

We are always prepared to co-operate with Gas Companies in connection with the installation of these plants, and in most cases the Gas Companies themselves act as our local agents for the distribution of these Boilers and Heaters.

ALL THE LEADING GAS COMPANIES ALLOW A MATERIAL REBATE ON GAS CONSUMED IN THESE BOILERS AND HEATERS, THIS REBATE DEPENDING UPON THE GAS CONSUMPTION.

SPECIAL TELEGRAPHIC CODE WORDS USED.

SPECIAL CODE WORDS FOR GAS-FIRED STEAM BOILERS.			SPECIAL CODE WORDS FOR GAS-FIRED WATER HEATERS.		
SIZE.	TOWN'S GAS.	PRODUCER GAS.	SIZE.	TOWN'S GAS.	PRODUCER GAS.
½ B.	BENNY	PENNY	½ B.H.	HARRY	PARRY
1 B.	BARNY	PARNY	1 B.H.	HEAVY	PEAVY
2 B.	BEATY	PEATY	2 B.H.	HILLY	PILLY
3 B.	BIBLE	PIBLE	3 B.H.	HONEY	PONEY
4 B.	BOGEY	POGEY	4 B.H.	HUFFY	PUFFY
5 B.	BUGGY	PUGGY	5 B.H.	HYRAM	PYRAM
6 B.	BYRON	PYRON			
7 B.	BATON	PATON			
8 B.	BITER	PITER			

These Code Words represent Boilers for a working pressure of 120 lbs. per square inch, complete with 25 feet of chimney, to Standard Specification (see pages 23 and 35).

If a low pressure Boiler is required, *i.e.*, less than 25 lbs. per square inch—involving larger steam mountings—add the Code Word "LOWPA."

If a Gas Regulator is required, add the Code Word "REGLA."

If a High Pressure (above 25 lbs. per square inch) Feed Water Regulator is required, add the Code Word "HIREG." If a Low Pressure (less than 25 lbs. per square inch) "LOREG."

Cook, Hammond & Kell Ltd.
Printers,
Westminster, S.W.—4169